

Fortinet VM On-Demand Program - Administration Guide

Phase 1.0

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Thursday, November 16, 2017

Fortinet VM On-Demand Program - Administrative Guide

Phase 1.0

TABLE OF CONTENTS

Introduction	4
Overview	4
Software info	4
FortiOS Virtual Appliance	4
FortiManager	4
Licensing	4
Fortinet VM On-Demand Program Validation	5
Creating and configuring a Metering Group in FortiCare	6
Deployment and Configuration	13
Example configuration	13
user-data-file	14
fgt-init.conf-file	14
System commands	14
On fosvm-ci	14
Example of FortiOS-VM Deployment	15
Adding and Authorizing a FortiOS-VM instance in FortiManager	18
FortiOS-VM Communication	22
FortiOS-VM	24
FortiOS-VM on ESXi	24
FortiOS-VM on KVM	26
Drive configuration	26
Metering and Points	28
FortiOS-VM Trial mode	28
Traffic volume point calculations	28
Overages	28
Traffic Details	28
Interfaces:	28
Policies:	29
Debugging	30
FortiManager	30
FortiOS-VM	31
Verify communication between FortiOS and FortiMeter	31
Verify licenced enabled instance on VDOM	31

Introduction

Overview

The Fortinet VM On-Demand Program is designed to enable Service Providers to deliver award-winning Fortinet firewall and other protection in an on-demand; pay-as-you-grow model that is better aligned with the agility and elasticity in modern Cloud and managed service offerings. Members of Fortinet's MSSP Partner Program, as well as other qualified service providers globally, can deploy scalable virtualized firewalling and advanced security services on an as-needed, per-tenant basis with actual costs automatically and transparently measured based on actual usage.

Software info

FortiOS Virtual Appliance

- FortiOS 5.4.1 and newer

FortiManager

Supported Version

- FortiManager v5.4 and newer

Supported Models

- FortiManager-3000C/F
- FortiManager-3900E
- FortiManager-4000D/E
- FortiManager-VM

Licensing

This program consists of a program membership (Yearly renewal) and point packages. The program membership is very similar to a license add on but it differs in that there is no .lic file to download. FortiManager automatically checks your eligibility with FortiCare and FortiGuard. Without the core program membership, you cannot use this program.

There is an order in which you have to register the program in FortiCare in order to get everything setup and working properly.

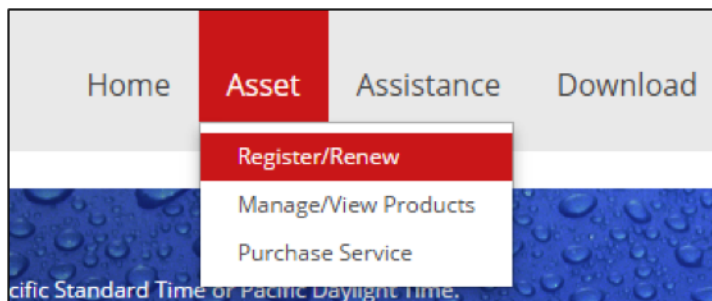
1. Register your FortiManager in FortiCare
2. Create your Metering Group in FortiCare with the Program's license registration code

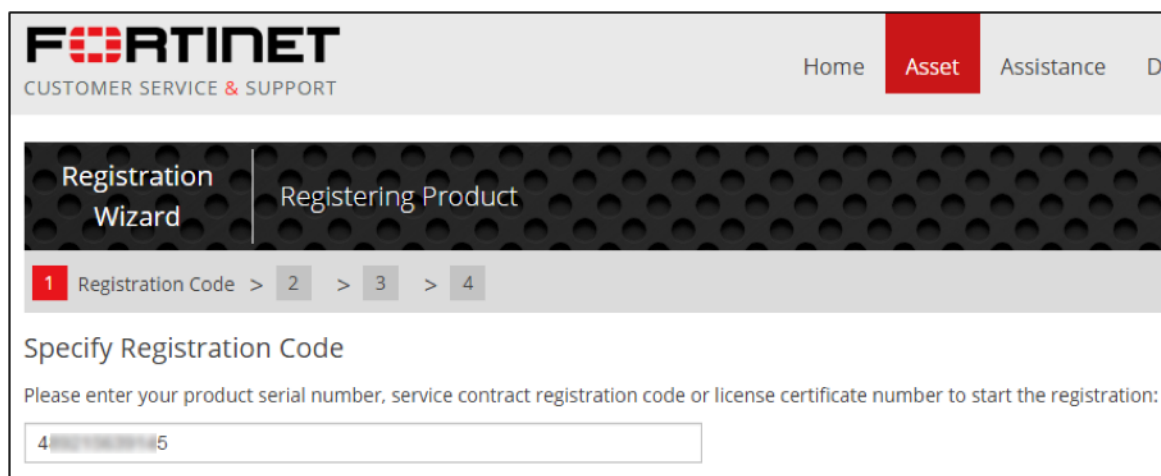
Creating and configuring a Metering Group in FortiCare

1. Registration code

Service Entitlement Summary		
Date: April 18, 2016		
Purchase Order Number: ITF [REDACTED]		
Contract Registration Code: 4 [REDACTED] 5		
<u>Support / Maintenance / Subscription Services Included</u>		
Qty	Part Number	Description
1	FC-10-SPVOL-402-02-02	60 days coverage for FortiMeter include: Metering based on usage

2. Register in FortiCare to create your Metering Group





The screenshot shows the Fortinet Customer Service & Support portal. The top navigation bar includes 'Home', 'Asset' (highlighted in red), and 'Assistance'. Below the navigation bar, the 'Registration Wizard' is active, with 'Registering Product' as the sub-header. A progress bar indicates four steps: 1 (active, red), 2, 3, and 4. The main heading is 'Specify Registration Code'. Below this, a text prompt asks the user to enter their product serial number, service contract registration code, or license certificate number. A text input field contains the value '4' followed by a masked area and '5'.

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Home **Asset** Assistance D

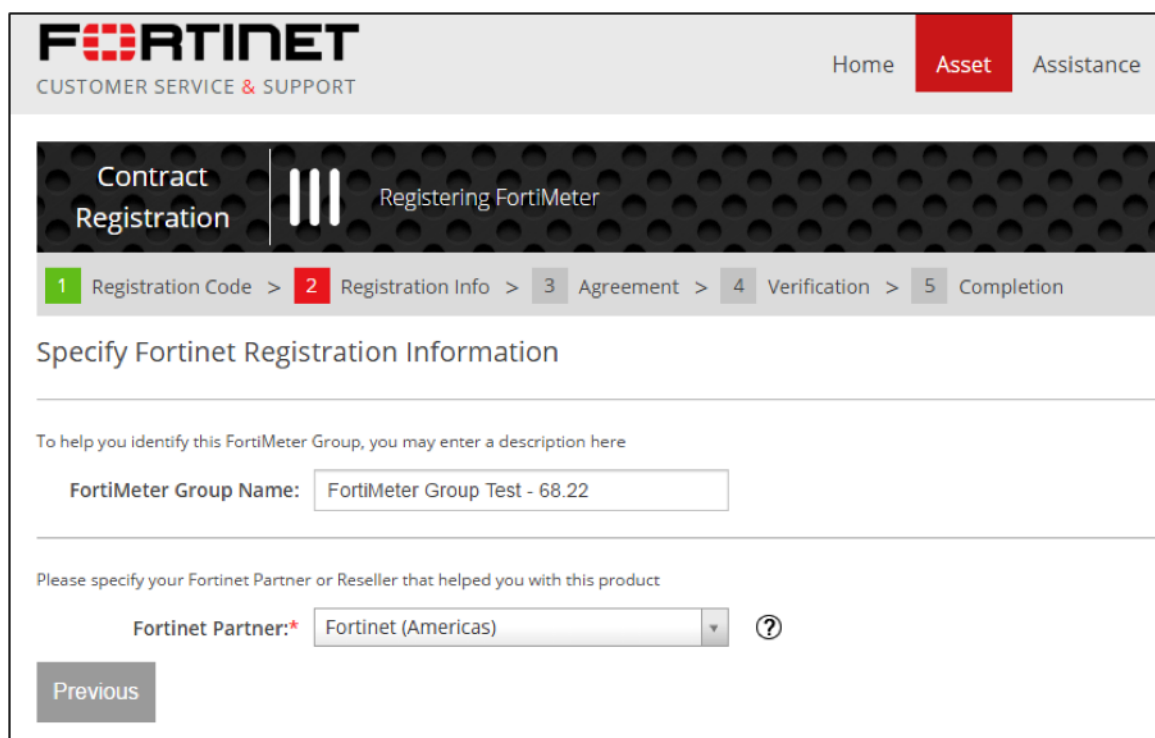
Registration Wizard | Registering Product

1 Registration Code > 2 > 3 > 4

Specify Registration Code

Please enter your product serial number, service contract registration code or license certificate number to start the registration:

4 [masked] 5



The screenshot shows the Fortinet Customer Service & Support portal. The top navigation bar includes 'Home', 'Asset' (highlighted in red), and 'Assistance'. Below the navigation bar, the 'Contract Registration' section is active, with 'Registering FortiMeter' as the sub-header. A progress bar indicates five steps: 1, 2 (active, red), 3, 4, and 5. The main heading is 'Specify Fortinet Registration Information'. Below this, a text prompt asks the user to enter a description to help identify the FortiMeter Group. A text input field contains the value 'FortiMeter Group Name: FortiMeter Group Test - 68.22'. Below this, another text prompt asks the user to specify their Fortinet Partner or Reseller. A dropdown menu is set to 'Fortinet (Americas)', with a question mark icon to its right. A 'Previous' button is located at the bottom left.

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Home **Asset** Assistance

Contract Registration | Registering FortiMeter

1 Registration Code > 2 Registration Info > 3 Agreement > 4 Verification > 5 Completion

Specify Fortinet Registration Information

To help you identify this FortiMeter Group, you may enter a description here

FortiMeter Group Name: FortiMeter Group Test - 68.22

Please specify your Fortinet Partner or Reseller that helped you with this product

Fortinet Partner:* Fortinet (Americas) ?

Previous

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128404 - Fortinet

Contract Registration

Registering FortiMeter

Contract Number : 489215639145

1 Registration Code >

2 Registration Info >

3 Agreement >

4 Verification >

5 Completion

Fortinet Product Registration Agreement

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For FortiCare™, FortiGuard™ and other Service Offerings

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☒ I have read, understood and accepted the contract stated above

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LOG OUT

128404 - Fortinet

Contract Registration

Registering FortiMeter

Contract Number : 489215639145

1 Registration Code >

2 Registration Info >

3 Agreement >

4 Verification >

5 Completion

Verification

Important Notice:

READ BEFORE COMPLETING THE REGISTRATION.

Product Entitlement:

Support Type	Support Level	Activation Date	Expiration Date
Metering based on usage	Web/Online	2016-05-12	2016-07-11

Entitlement calculation is based on any existing warranty or contract services plus the term of your new contract. If you have questions regarding these conditions, please open a ticket for Registration Assistance by clicking [here](#).

☒ BY ACCEPTING THESE TERMS, YOU ARE ACTIVATING THIS SUPPORT CONTRACT AND THE ENTITLEMENT PERIOD PROVIDED CAN NOT BE CHANGED. IF YOU WISH TO CONTINUE, CLICK "CONFIRM" BUTTON TO SUBMIT YOUR REQUEST.

Previous

Confirm

Registration Completed

Thank you for choosing this Fortinet product. Your registration process has completed successfully. Please be aware that the registration information may not reflect on your product immediately, a delay (up to 4 hours) can occur.

Product Info

General

Product Model

FortiMeter

Serial Number:

FMGVOLC-2

Registration Date:

2016-05-12

Partner:

Fortinet (Americas)

Point Balance:

0.00

Usage Type:

Volume

FortiMeter Group Name:

FortiMeter Group Test - 68.22

FortiMeter Group Status:

Valid

Support Coverage

Support Type	Support Level	Activation Date	Expiration Date
Metering based on usage	Web/Online	2016-05-12	2016-07-11

Registered Support Contract

Contract Number	SKU	Creation Date	Registration Date
4-15	FC-10-SPVOL-402-02-02	2016-04-18	2016-05-12

Register More

Finish

3. Link FortiManager(s) to the Metering Group

Product Details

FortiMeter
FMGVOL0000000112

Back To List

Information

General

Location

Entitlement

License & Key

Link Device

Registration

Renew Contract

Add Licenses

Assistance

Ticket List

Technical Request

Customer Service

DOA/RMA Request

Product List Services

FortiManager

No FortiManager linked

Available FortiManager

	Serial Number	Product Model	SerialNumber	ModelName	Description	RegistrationDate
<input type="checkbox"/>	FMG-VM0-000000007	FortiManager-VM	FMG-VM0-000000007	FortiManager-VM	FMG-VM AWS v5.2.2	1/1/0001 12:00:00 AM
<input type="checkbox"/>	FMG-VM0-000000008	FortiManager-VM	FMG-VM0-000000008	FortiManager-VM	GPC FMG-VM	1/1/0001 12:00:00 AM
<input checked="" type="checkbox"/>	FMG-VM0-000000007	FortiManager-VM	FMG-VM0-000000007	FortiManager-VM	Metering Module #1	1/1/0001 12:00:00 AM
<input type="checkbox"/>	FMG-VM0-000000008	FortiManager-VM	FMG-VM0-000000008	FortiManager-VM	Metering Module #2	1/1/0001 12:00:00 AM

Add

Product Details

FortiMeter
FMGVOL0000000112

Back To List

Information

General

Location

Entitlement

License & Key

Link Device

Registration

Renew Contract

Add Licenses

Assistance

Ticket List

Technical Request

Customer Service

DOA/RMA Request

Anti Virus Ticket

WebChat

Product List Services

FortiManager

<input type="checkbox"/>	Serial Number	Product Model	SerialNumber	ModelName	Description	RegistrationDate
<input type="checkbox"/>	FMG-VM0A-7	FortiManager-VM	FMG-VM0A-7	FortiManager-VM	Metering Module #1	5/12/2016 12:21:10 PM

Delete

Available FortiManager

<input type="checkbox"/>	Serial Number	Product Model	SerialNumber	ModelName	Description	RegistrationDate
<input type="checkbox"/>	FMG-VM0A-7	FortiManager-VM	FMG-VM0A-7	FortiManager-VM	FMG-VM AWS v5.2.2	1/1/0001 12:00:00 AM
<input type="checkbox"/>	FMG-VM0A-8	FortiManager-VM	FMG-VM0A-8	FortiManager-VM	GPC FMG-VM	1/1/0001 12:00:00 AM
<input type="checkbox"/>	FMG-VM0A-8	FortiManager-VM	FMG-VM0A-8	FortiManager-VM	Metering Module #2	1/1/0001 12:00:00 AM

Add

4. Add Point Packs to you Metering Group

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FortiMeter License Certificate

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Sunnyvale, CA 94086 U.S.A.

Fortinet Singapore Private Limited

300 Beach Road #20-01

The Concourse, Singapore 199555

Licenses:

FORTINET, INC.

Registration Code:

G-1112-XXXX-XXXX-XXXX-XXXX-B

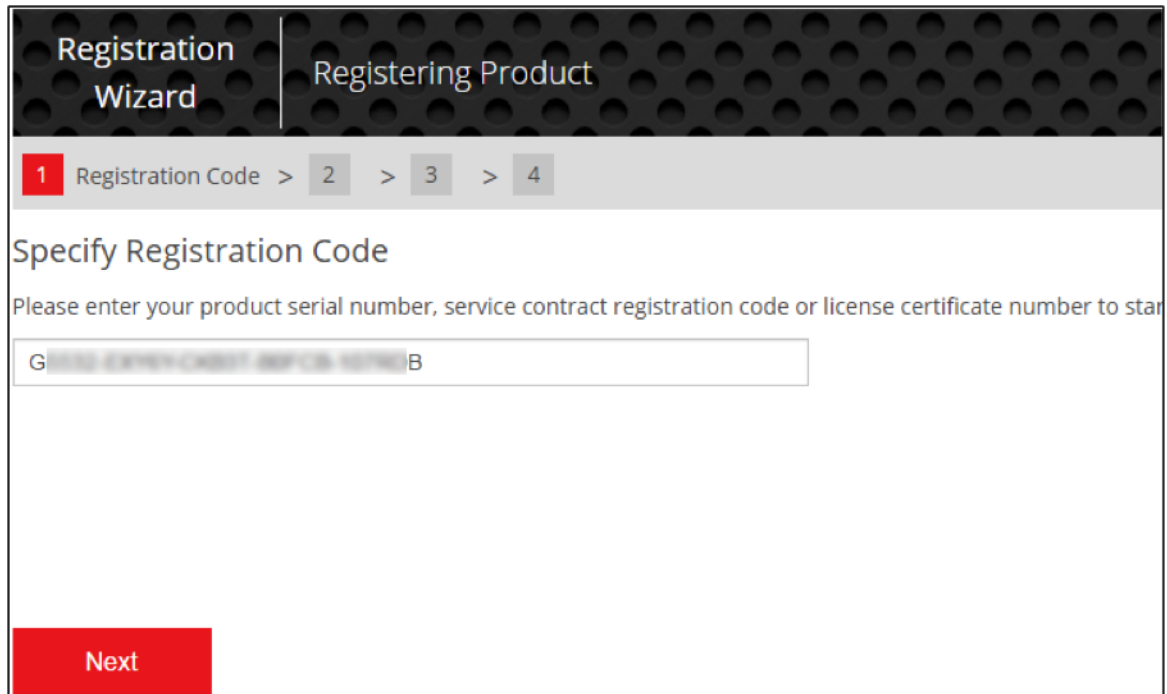
Sales Order:

II-527491

SP-VM1K

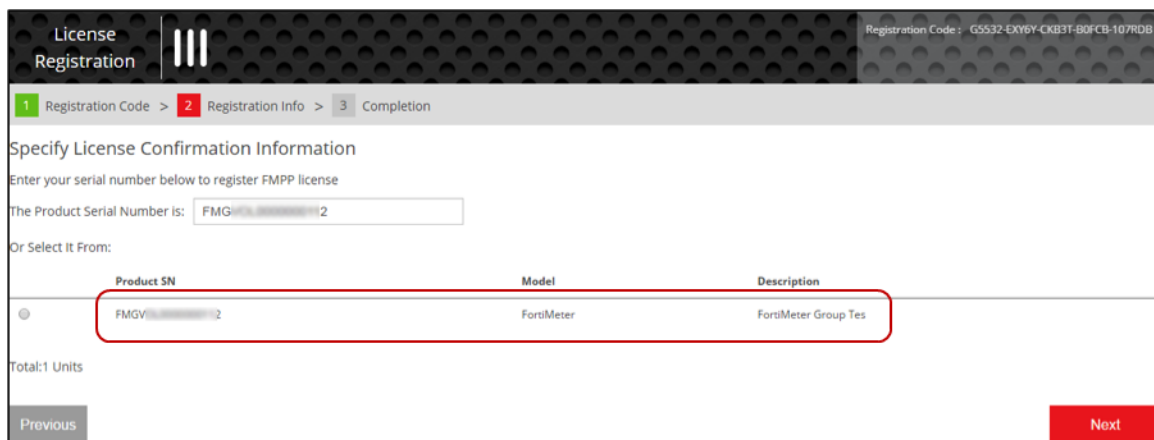
FMPP0000127

Adds 1,000 points to the Fortinet MSSP On-Demand program account



The screenshot shows the 'Registration Wizard' with the 'Registering Product' step selected. A progress bar at the top indicates four steps: 1 (Registration Code, highlighted in red), 2, 3, and 4. The main heading is 'Specify Registration Code'. Below it, a text prompt says 'Please enter your product serial number, service contract registration code or license certificate number to start'. A text input field contains the value 'G5532-XY6Y-CKB3T-B0FCB-107RDB'. A red 'Next' button is located at the bottom left.

Select Metering Group to associate the Point Pack with:



The screenshot shows the 'License Registration' wizard at the 'Registration Info' step. The progress bar shows three steps: 1 (Registration Code, green), 2 (Registration Info, highlighted in red), and 3 (Completion). The heading is 'Specify License Confirmation Information'. A text prompt says 'Enter your serial number below to register FMPP license'. Below this, it says 'The Product Serial Number is:' followed by a text field containing 'FMGV...2'. Underneath, it says 'Or Select It From:'. A table with three columns: 'Product SN', 'Model', and 'Description' is shown. The first row is selected and highlighted with a red box. The table content is as follows:

Product SN	Model	Description
FMGV...2	FortiMeter	FortiMeter Group Tes

Below the table, it says 'Total: 1 Units'. At the bottom left is a 'Previous' button, and at the bottom right is a red 'Next' button.

Registration Completed

Thank you for choosing this Fortinet product. Your registration process has completed successfully. Please be aware that the registration information may not reflect on your product immediately, a delay (up to 4 hours) can occur.

Product Info

General

Product Model

FortiMeter

Serial Number:

FMGVC-16001317-2

Registration Date:

2016-05-12

Partner:

Fortinet (Americas)

Point Balance:

1000.00

Usage Type:

Volume

FortiMeter Group Name:

FortiMeter Group Test - 68.22

FortiMeter Group Status:

Valid

Support Coverage

Support Type	Support Level	Activation Date	Expiration Date
Metering based on usage	Web/Online	2016-05-12	2016-07-11

Registered Support Contract

Contract Number	SKU	Creation Date	Registration Date
4-16001317-5	FC-10-SPVOL-402-02-02	2016-04-18	2016-05-12

Registered License(s)

License Type	License Number	Registration Date	Used Amount	Remaining Balance	Expiration Date
FortiMeter	FMPP-16001317-7	2016-05-12	0.00	1000.00	2017-05-12

Adds 1,000 points to the Fortinet MSSP On-Demand program account

Modules

Serial Number	Product Model	SerialNumber	ModelName	Description	RegistrationDate
FMG-VM0A16001317	FortiManager-VM	FMG-VM0A16001317	FortiManager-VM	Metering Module #1	5/12/2016 12:21:10 PM

Register More

Finish

Product Details

FortiMeter

FMGVOL0000000112

Back To List

Information

General

Location

Entitlement

License & Key

Link Device

Registration

Renew Contract

Add Licenses

Assistance

Ticket List

Product Information

General

Product Model

FortiMeter

Serial Number:

FMGXXXXXXXXXX2

Registration Date:

2016-05-12

Partner:

Fortinet (Americas)

Point Balance:

1000.00

Usage Type:

Volume

FortiMeter Group Name:

FortiMeter Group Test - 68.22

FortiMeter Group Status:

Valid

Edit

Deployment and Configuration

There are three components to this program:

1. FortiOS-VM (ESXi/KVM)
2. FortiManager (Metering Module)
3. FortiCare/FortiGuard

FortiManager does the metering and can only be enabled by being specifically designated in FortiCare. The FortiOS virtual appliance (FortiOS-VM) is the security enforcement point and is authorized by the FortiManager which consequently reports these statistics to FortiCare which manages all point calculations.

During the installation of the FortiOS-VM, you will be prompted to provide the FortiManager IP address. This will allow the FortiOS-VM to register with the FortiManager. These are metered by the volume of traffic processed by the FortiOS engine. The amount of points consumed depends on what FortiGuard services are enabled.

Point Packs can be purchased and added to Metering Group(s) in FortiCare (<https://support.fortinet.com>). FortiManager is required to be in contact with FortiCare and FortiGuard at all times for FortiGuard updates, it's own metering validation and transmission of usage statistics.

During installation of FortiOS-VM, the administrator will be required to specify the FortiManager's IP address or resolvable DNS name. This value will be injected into the installation so that the FortiOS-VM will register with the FortiManager the first time it's powered on.



Deploying FortiOS-VM will require the vSphere Web client (available as a part of vCenter Server) due to the need to inject the FortiManager IP into the installation. The desktop client of vSphere does not support this input and thus can't be used.

Additional FortiOS-VM details:

- No Fortinet limits to the vCPU and RAM values
- Support for only a single VDOM
- Two ports are metered by Metering Module (Port1, Port2)
- MGMT port is only for FMG <-> FortiOS communication

Example configuration

The following is an example configuration.

The example takes two configuration files.

1. The user-data-file: As implied, is used only for user data.
2. The fgt-init.conf-file: This is passed as a file via `--file fgt-init-conf=<file>` as part of nova boot with config drive.

The example files are created as follows.

user-data-file

- System:compute1
- Account:root
- File system context: ~/config-drive

```
cat fmg-user-data.txt
{ "fmgaddress" : "192.168.10.10" }
```

fgt-init.conf-file

- System:compute1
- Account:root
- File system context: ~/config-drive

```
cat fos-config.txt
config system dns
    set primary 192.168.10.1
    unset secondary
end
config system global
    set hostname fosvm-ci
end
config system central-management
    set type fortimanager
    set fmg "10.0.0.1"
end
fos vm config script
```

System commands

- System:compute1
- Account:root
- File system context: ~/config-drive

```
nova boot --config-drive true --flavor m1.fgt.small \
--image fos-vm-build7099 \
--user-data /root/config-drive/fmg-user-data.txt \
--file fgt-init.conf=/root/config-drive/fos-config.txt \
--nic net-id=0a0c631f-759a-4133-a300-3dba881ad86a \
--nic net-id=4386bea5-5957-4e2c-bf89-a7184b0c9448 \
--security-group open fos1
```

On fosvm-ci

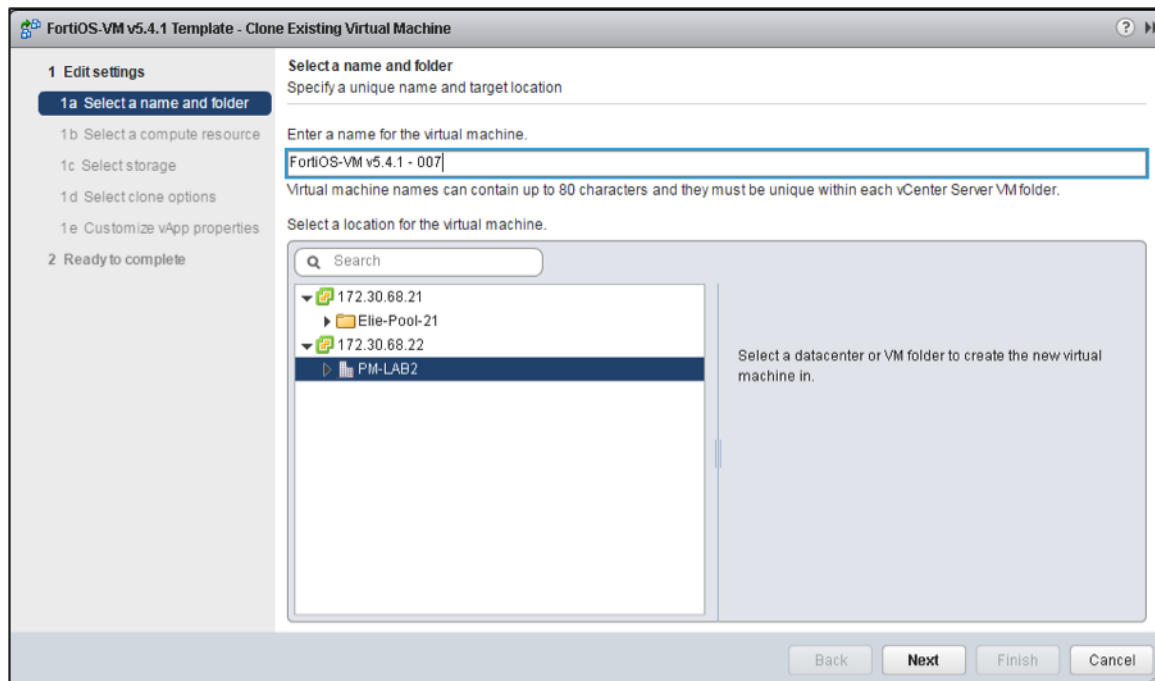
```
show system central-management
config system central-management
    set type fortimanager
    set fmg "192.168.10.10"
    config server-list
    edit 0
```

```
set server-type update rating
set server-address 192.168.10.10
next
end
set include-default-servers disable
end
config system dns
set primary 192.168.10.1
end
```

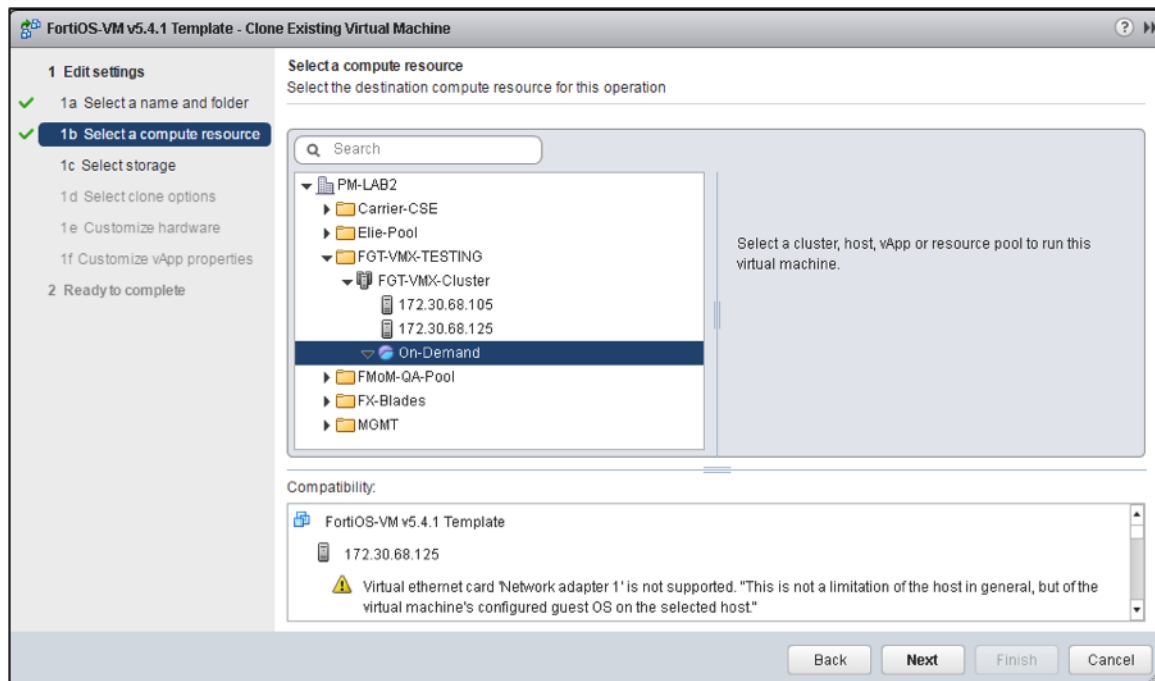
Example of FortiOS-VM Deployment

Deploying FortiOS-VM is no different than deploying a FortiGate-VM image and we won't go into each process in the document. In this example, we're showing a manual deployment through the VMware vSphere Web Client.

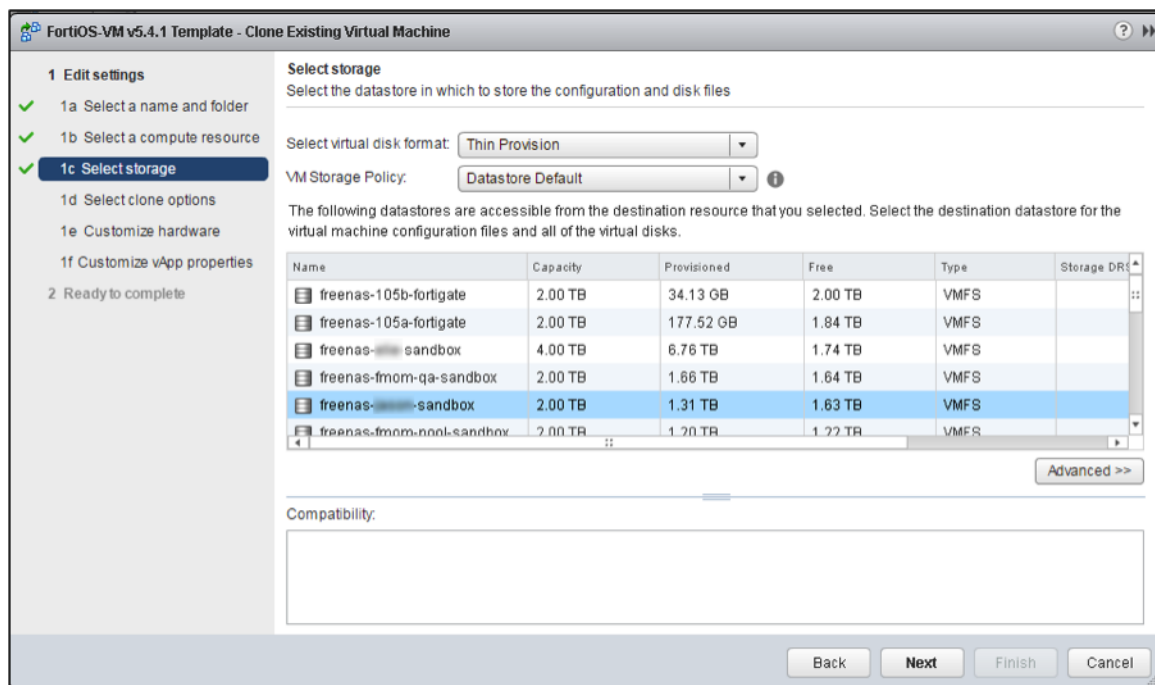
1. Enter the name of FortiOS Virtual Appliance



2. Resource assignment



3. Storage settings



4. Post deployment options

The screenshot shows the 'FortiOS-VM v5.4.1 Template - Clone Existing Virtual Machine' wizard. The left sidebar lists steps: 1 Edit settings (1a Select a name and folder, 1b Select a compute resource, 1c Select storage, 1d Select clone options, 1e Customize vApp properties, 2 Ready to complete). Step 1d is selected. The main area is titled 'Select clone options' and 'Select further clone options'. It contains three checkboxes: 'Customize the operating system' (unchecked), 'Customize this virtual machine's hardware (Experimental)' (unchecked), and 'Power on virtual machine after creation' (checked). At the bottom are 'Back', 'Next', 'Finish', and 'Cancel' buttons.

5. Set the location of the FortiManager, hostname of the FortiOS-VM instance as well as configuring DNS

The screenshot shows the 'FortiOS-VM v5.4.1 Template - Clone Existing Virtual Machine' wizard, Step 1e: Customize vApp properties. The left sidebar shows step 1e is selected. The main area is titled 'Customize vApp properties' and 'Edit the vApp properties'. It includes a message 'All properties have valid values' and links 'Show next...' and 'Collapse all...'. A table lists properties under 'Uncategorized' (14 settings):

Property	Value
FortiManagerAddress	FortiManager Hostname or IP 19.1.1.110
Hostname	FortiOS-VM007
Primary DNS	4.2.2.1
Secondary DNS	8.8.8.8
Interface 1: Mode	IP/Netmask will be ignored if DHCP is chosen. DHCP
IP	0.0.0.0
Netmask	0.0.0.0
Gateway	0.0.0.0
Interface 2: Mode	IP/Netmask will be ignored if DHCP is chosen.

At the bottom are 'Back', 'Next', 'Finish', and 'Cancel' buttons.

6. Network settings of each of the ports. In this example we have set them all for DHCP

FortiOS-VM v5.4.1 Template - Clone Existing Virtual Machine

1 Edit settings

- 1a Select a name and folder
- 1b Select a compute resource
- 1c Select storage
- 1d Select clone options
- 1e Customize vApp properties**
- 2 Ready to complete

Customize vApp properties
Edit the vApp properties

All properties have valid values [Show next...](#) [Collapse all...](#)

Interface 1: Mode	IP/Netmask will be ignored if DHCP is chosen. DHCP
IP	0.0.0.0
Netmask	0.0.0.0
Gateway	0.0.0.0
Interface 2: Mode	IP/Netmask will be ignored if DHCP is chosen. DHCP
IP	0.0.0.0
Netmask	0.0.0.0
Interface 3: Mode	IP/Netmask will be ignored if DHCP is chosen. DHCP
IP	0.0.0.0

Back Next Finish Cancel

7. Verify configuration and deploy

FortiOS-VM v5.4.1 Template - Clone Existing Virtual Machine

1 Edit settings

- 1a Select a name and folder
- 1b Select a compute resource
- 1c Select storage
- 1d Select clone options
- 1e Customize vApp properties
- 2 Ready to complete**

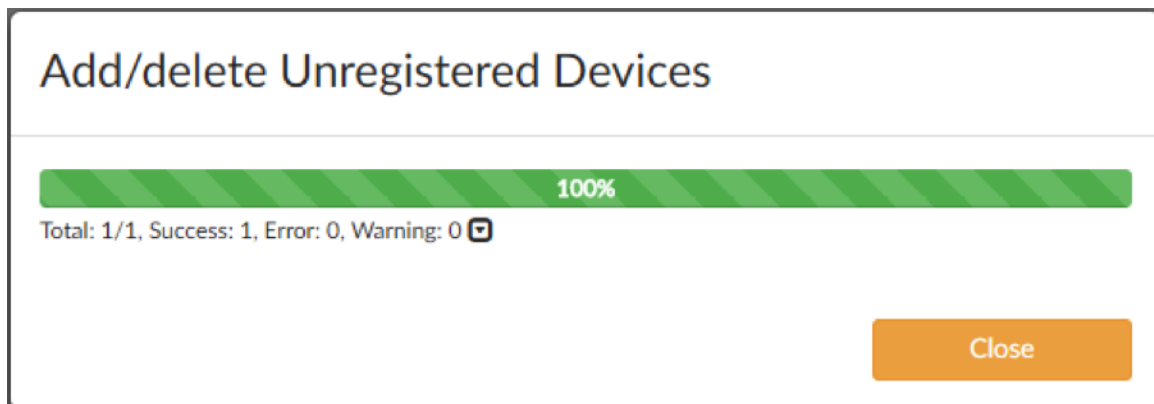
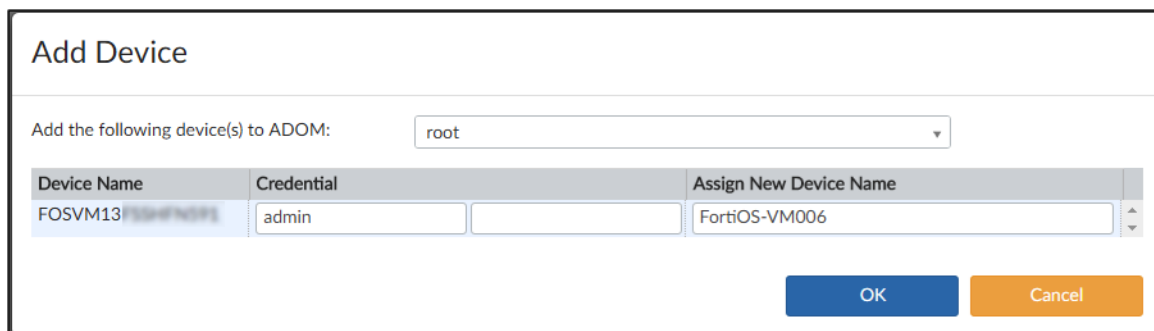
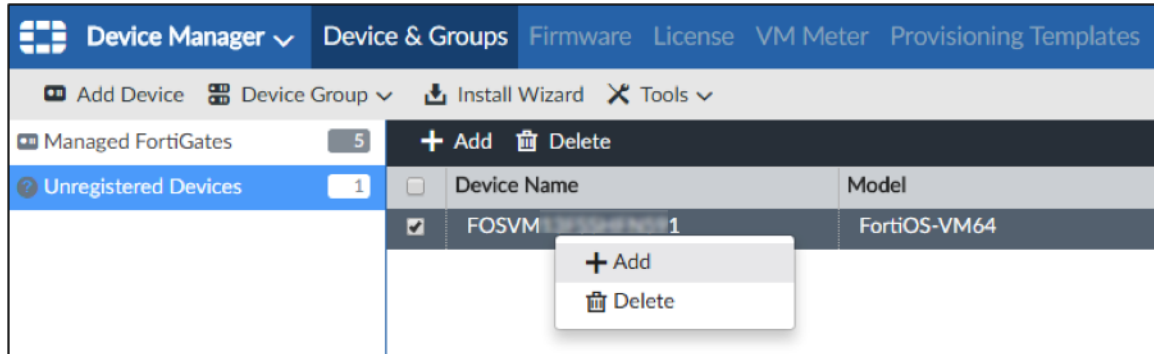
Provisioning type:	Clone an existing virtual machine
Source virtual machine:	FortiOS-VM v5.4.1 Template
Virtual machine name:	FortiOS-VM v5.4.1 - 007
Folder:	PM-LAB2
Resource pool:	On-Demand
Datastore:	freenas sandbox
Disk storage:	Thin Provision
vApp properties	FortiManagerAddress = 19.1.1.110 Hostname = FortiOS-VM007 Primary DNS = 4.2.2.1 Secondary DNS = 8.8.8.8 Interface 1: Mode = DHCP IP = 0.0.0.0 Netmask = 0.0.0.0 Gateway = 0.0.0.0 Interface 2: Mode = DHCP IP = 0.0.0.0 Netmask = 0.0.0.0 Interface 3: Mode = DHCP IP = 0.0.0.0 Netmask = 0.0.0.0

Back Next Finish Cancel

Adding and Authorizing a FortiOS-VM instance in FortiManager

When a new FortiOS-VM instance is deployed by whatever method best serves the Service Provider, upon first boot it will register itself with FortiManager. The following steps show how to add the FortiOS-VM to its inventory and authorize its usage.

1. Add device to FortiManager inventory (this is the same method all FortiManager administrators are already familiar with)



- ## 2. “VM Meter” tab

Device Manager ▾ Device & Groups Firmware License VM Meter Provisioning Templates				
<input checked="" type="checkbox"/> Authorize <input checked="" type="checkbox"/> Refresh				
Device Name	Serial Number	FortiGuard	License Status	Today Usage
FortiOS-VM001	FOSVM-123456789012	FW Only		69 GB
FortiOS-VM002	FOSVM-123456789017	FW Only		6 KB
FortiOS-VM003	FOSVM-123456789019	FW+URL		6 KB
FortiOS-VM004	FOSVM-12345678901B	Full UTM		6 KB
FortiOS-VM005	FOSVM-12345678901B	FW+URL		6 KB
FortiOS-VM006	FOSVM-123456789011	FW Only	Not Authorized (0 Hours)	0 B

3. Authorize the FortiOS-VM instance as a trial or standard

Device Manager ▾ Device & Groups Firmware License VM Meter Provisioning Templates				
<input checked="" type="checkbox"/> Authorize <input checked="" type="checkbox"/> Refresh				
Device Name	Serial Number	FortiGuard	License Status	Today Usage
FortiOS-VM001	FOSVM-123456789012	FW Only		69 GB
FortiOS-VM002	FOSVM-123456789017	FW Only		6 KB
FortiOS-VM003	FOSVM-123456789019	FW+URL		6 KB
FortiOS-VM004	FOSVM-12345678901B	Full UTM		6 KB
FortiOS-VM005	FOSVM-12345678901B	FW+URL		6 KB
FortiOS-VM006	FOSVM-123456789011	FW Only	Not Authorized (0 Hours)	0 B

Authorize Device

Serial Number

FOSVM-123456789011

Device Name

FortiOS-VM006

Up Since

Fri Jun 24 15:56:31 2016

vCPU

1

RAM

994 MB

License Type

Trial ▾

Trial

Standard

Services

OK

Cancel

4. Choose the Service Level for that instance

Authorize Device

Serial Number

FOSVM13P33H4FND001

Device Name

FortiOS-VM006

Up Since

Fri Jun 24 15:56:31 2016

vCPU

1

RAM

994 MB

License Type

Standard

Services

FW Only

FW Only

FW+URL

Full UTM

Cancel

Device Manager Device & Groups Firmware License VM Meter Provisioning Templates				
<div> <div>Authorize</div> <div>Refresh</div> </div>				
Device Name	Serial Number	FortiGuard	License Status	Today Usage
FortiOS-VM001	FOSVM13P33H4FND002	FW Only	✓	69 GB
FortiOS-VM002	FOSVM13P33H4FND007	FW Only	✓	6 KB
FortiOS-VM003	FOSVM13P33H4FND009	FW+URL	✓	6 KB
FortiOS-VM004	FOSVM13P33H4FND00B	Full UTM	✓	6 KB
FortiOS-VM005	FOSVM13P33H4FND00B	FW+URL	✓	6 KB
FortiOS-VM006	FOSVM13P33H4FND001	Full UTM	✓	0 B

FortiOS-VM Communication

The FortiOS-VM will generate a unique serial number when powered up. This will be passed to FortiManager during registration.

Note: This serial number cannot be registered to FortiCare.

Specify Registration Code

Invalid input data:
Please enter a valid registration number.

Please enter your product serial number,

FOSVM 1FT-PHAB06

The FortiOS-VM will cache its own uptime in case of disconnection from FortiManager. Should it be disconnected, it will sync its stats with the FortiManager database once reconnected. This will provide consistency and accuracy for proper reporting.

In order for VM Meter service to function properly, you need to ensure the service access options are enabled on the MGMT interface, or the interface in which you are using to manage the FortiManager. You can do this either via the CLI or the GUI:

```
set serviceaccess fgtupdates fclupdates webfilter-antispam
```

Or in the GUI:

System Network Management Interface

Name	port1
IP Address/Netmask	192.168.2.114/255.255.255.0
IPv6 Address	::/0
Administrative Access	<input checked="" type="checkbox"/> HTTPS <input checked="" type="checkbox"/> HTTP <input checked="" type="checkbox"/> PING <input checked="" type="checkbox"/> SSH <input checked="" type="checkbox"/> TELNET <input type="checkbox"/> SNMP <input type="checkbox"/> Web Service
IPv6 Administrative Access	<input type="checkbox"/> HTTPS <input type="checkbox"/> HTTP <input type="checkbox"/> PING <input type="checkbox"/> SSH <input type="checkbox"/> TELNET <input type="checkbox"/> SNMP <input type="checkbox"/> Web Service
Service Access	<input checked="" type="checkbox"/> FortiGate Updates <input checked="" type="checkbox"/> Web Filtering

There is a set period of time (15 days) from first disconnection from FortiManager to invalidation of the FortiOS-VM instance.

FOS-VM is required to send the following information every 5 minutes to FortiManager:

- Serial Number/UUID
- IP address
- Hostname

- # of CPUs
- Amount of RAM
- FortiGuard features enabled
- Traffic Volume

You can see this information, and authorize your FortiOS-VM's under the VM Meter tab (Click to enlarge):

Device Name	Serial Number	vCPU	RAM	FortiGuard	License Status	Today Usage	Last Seen	His
FOSVM-FT-PM08CB6	FOSVM-FT-PM08CB6	1	994 MB	FW Only	OK	30 MB	0 minute(s) ago	

Here you can see all the relevant reported data from FortiOS-VM. Not quite visible is a historical column where you can view the details reported to FortiManager from the FortiO-VM.

You can authorize your FortiOS-VM either by clicking the Authorize button or by double clicking on the VM in the list:

Authorize Device

Serial Number: FOSVM-FT-PM08CB6

Device Name: FOSVM-FT-PM08CB6

Up Since: Thu Jan 7 12:43:36 2016

vCPU: 1

RAM: 994 MB

License Type: Standard ▼

Services: FW Only ▼

OK Cancel

You can authorize instances as either a standard license or in a trial mode (limit 2)

FortiOS-VM

- FortiOS-VM currently supports both VMware vSphere and KVM via auto-configuration from the central management settings. VMware environment are required to be fully licensed and managed by vCenter Server while KVM requires support for config drive).
- During the installation of the FortiOS-VM, user will need to provide the FortiManager IP address. This will then allow FortiOS-VM to register with the FortiManager and VM Meter service module and use to meter on the traffic throughput through the interfaces.
- FortiOS-VM only has three interfaces. (mgmt, port1, port2). It will only track the traffic usage on port1 and port2, as mgmt is use for management purpose.
- It only support maximum of 1 VDOM.
- There is no CPU/Memory allocation limitation. End user can adjust VM resource allocation after the deployment. However the default template for ovf only has 1 vcpu, and 1G of memory.
- Its SN is dynamically generated at the first deployment
- End user will be unable to register the devices with FortiCare nor any updates from FortiGuard, as SN is dynamically generated upon the first deployment. Therefore, user has to use FortiOS-VM along with FortiManager Metering Module.
- FortiOS-VM will not have EVAL mode as previous FortiGate-VM. It will not be in LENC mode initially.
- FortiOS-VM subscription/updates are controlled by the FortiManager Metering Module. For example, if user authorize the FortiOS-VM as FW service only. FortiOS-VM won't be able to get any updates nor any filtering services from the FortiManager.
- FortiOS-VM will constantly send it's traffic usage data to FortiManager Metering Module in the interval of every 5 minutes.

FortiOS-VM on ESXi

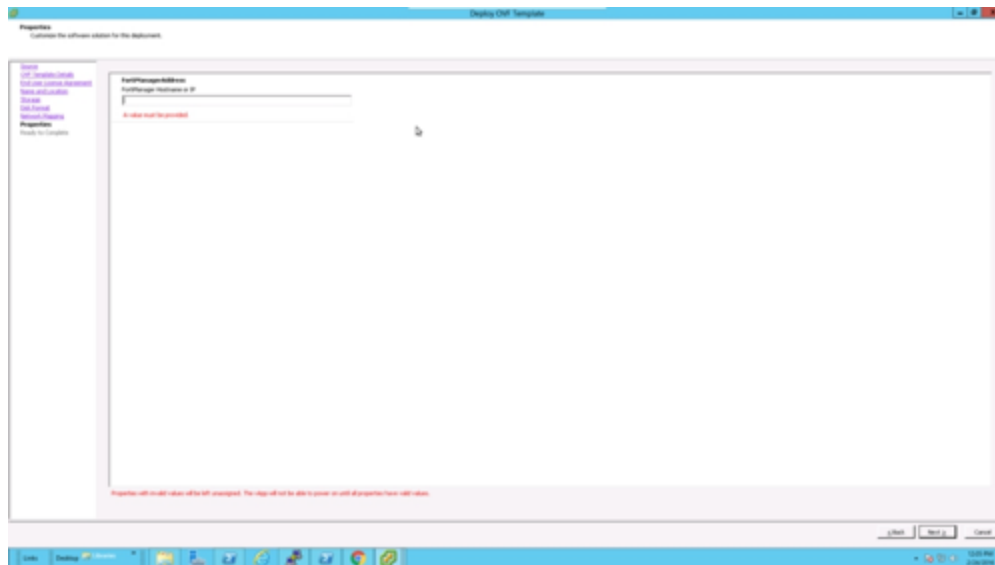
Currently, FortiOS-VM uses vApp to configure the FortiManager IP address for the central management setting. As you can see from the following.

```
<Property ovf:key="FortiManagerAddress" ovf:qualifiers="MinLen(1)" ovf:type="string"
  ovf:userConfigurable="true">
  <Label>FortiManagerAddress</Label>
  <Description>FortiManager Hostname or IP</Description>
</Property>
```

Hence, it is required for user to have VCSA in order to have vApp operating properly. If the user chooses to deploy the vApp Ovf template onto an ESXi host. User will encounter an error message such as the following:

<http://blog.acarter.co.uk/2013/08/this-ovf-package-uses-features-that-are-not-supported-when-deploying-directly-to- an-esx-host/>

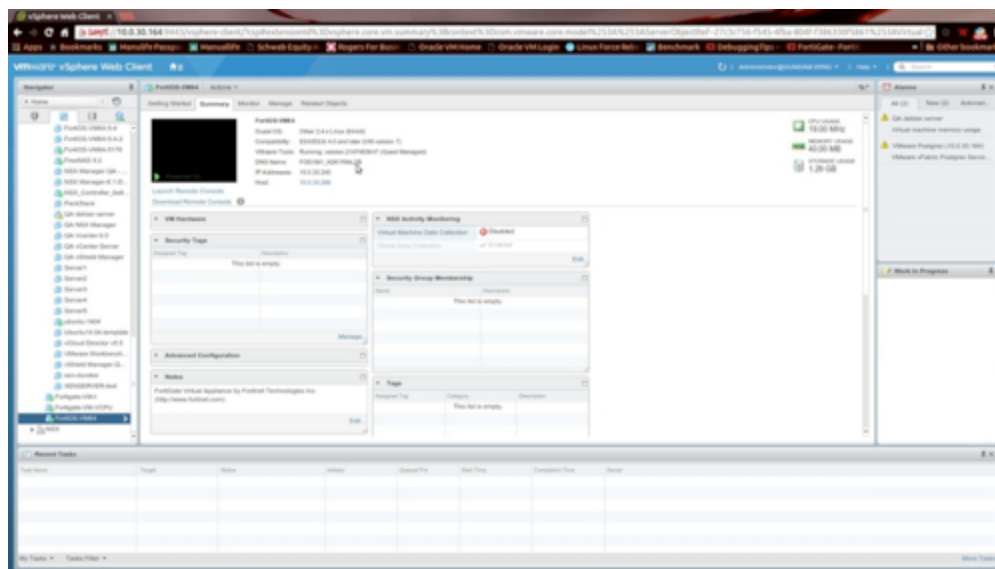
Now, during the deployment, user will be prompt for entering the FortiManager related information such as in the following screen shot.



Once user finish the deployment, FortiOS-VM will take the information provided for the FortiManager and populate the central management configuration in the configuration such as the following.

```
config system central-management
  set type fortimanager
  set fmg "10.0.30.141"
  set include-default-servers disable
end
```

By default, mgmt port on the FortiOS-VM is set to dhcp mode. Hence, the user should be able to gain access to the FortiOS-VM right after it gets deployed. As FortiOS-VM has vmttools installed in the code, the user can figure out the IP address it gets allocated without the need to launch a console from vSphere.



FortiOS-VM on KVM

Drive configuration

Currently, FortiOS-VM uses the `config-drive` feature on in OpenStack to auto-configure the FortiManager configuration during the deployment. As for other varieties of KVM hypervisor, users can always configure the settings afterwards.

For users that are using OpenStack or want to use the OpenStack `config-drive` feature, they can try to use DevStack to setup the environment.

<http://docs.openstack.org/developer/devstack/>.

And, also make sure the `config-drive` feature is enabled for the nova.

http://docs.openstack.org/user-guide/cli_config_drive.html

Once the OpenStack environment has been properly configured, users can use nova to deploy the FortiOS-VM into their OpenStack environment.

Supported drive settings

The following are supported drive configuration parameters:

Drive type: Disk

By default, you cannot attach the configuration drive image as a CD drive instead of as a disk drive. The setting should be automatically set to disk, but verification should be performed.

Format: ISO9660

The default format of the configuration drive as an ISO 9660 file system. To explicitly specify the ISO 9660 format, add the following line to the `/etc/nova/nova.conf` file:

```
config_drive_format=iso9660
```

For legacy reasons, you can configure the configuration drive to use VFAT format instead of ISO 9660. It is unlikely that you would require VFAT format because ISO 9660 is widely supported across operating systems.

Example configuration

Here is a sample nova command to use when deploying a FortiOS-VM. Users will have to modify the parameters to suit how their environment is setup.

```
#!/bin/sh
image="979a4658-e3db-4fbe-8d18-7a0e3bc55da7"
nova boot --config-drive true --flavor fgtvm-again --image "${image}" --user-
  data=fosvm.txt --nic net- id=97d29aa4-7ba5-4d43-9a91-b5b033450fcb --security-group
  default fosvm-54
```

`fosvm.txt` will be the file that contains the fortimanager ip information. Such as

```
{ "fmgaddress" : "10.0.30.141" }
```

After the commands have been run, the user should be able to see something like the following.

```
./nova.sh
+-----+-----+
| Property | Value |
+-----+-----+
| OS-DCF:diskConfig | MANUAL |
| OS-EXT-AZ:availability_zone | |
| OS-EXT-SRV-ATTR:host | - |
| OS-EXT-SRV-ATTR:hostname | fosvm-54 |
| OS-EXT-SRV-ATTR:hypervisor_hostname | - |
| OS-EXT-SRV-ATTR:instance_name | instance-00000005 |
| OS-EXT-SRV-ATTR:kernel_id | |
| OS-EXT-SRV-ATTR:launch_index | 0 |
| OS-EXT-SRV-ATTR:ramdisk_id | |
| OS-EXT-SRV-ATTR:reservation_id | r-op0jz0eq |
| OS-EXT-SRV-ATTR:root_device_name | - |
| OS-EXT-SRV-ATTR:user_data | eyAiZmlnYWwRkcmVzcyIgOiAiMTAuMC4zMC4xNDEiIH0K |
| OS-EXT-STS:power_state | 0 |
| OS-EXT-STS:task_state | scheduling |
| OS-EXT-STS:vm_state | building |
| OS-SRV-USG:launched_at | - |
| OS-SRV-USG:terminated_at | - |
| accessIPv4 | |
| accessIPv6 | |
| adminPass | Um5YWyeKyHL5 |
| config_drive | True |
| created | 2016-02-24T20:47:01Z |
| flavor | fgtvm-again (9) |

| hostId | |
| id | c1448a8e-33a6-4c8a-80f8-c6fe716d3a54 |
| image | fosvm (979a4658-e3db-4fbe-8d18-7a0e3bc55da7) |
| key_name | - |
| metadata | {} |
| name | fosvm-54 |
| os-extended-volumes:volumes_attached | [] |
| progress | 0 |
| security_groups | default |
| status | BUILD |
| tenant_id | 0405fece3603481a99aa5cd9da3cb867 |
| updated | 2016-02-24T20:47:01Z |
| user_id | 4eeca00da013461985dc8c6284aa0114 |
+-----+-----+
```

Once the FortiOS-VM boots up on openstack. The following configurations should be pre-configured properly

```
show sys central-management config system central-management
set type fortimanager set fmg "10.0.30.141"
set include-default-servers disable end
```

Metering and Points

FortiOS-VM Trial mode

When provisioning a FortiOS-VM in trial mode, be aware that this will not show up in the FortiCare reports. You can only provision 2 units as trial.

Traffic volume point calculations

Point calculations are based off of traffic passing through the FortiOS-VM interfaces. Points are used per terabyte of traffic and there is an increased point cost as you increase the FortiGuard services in use.

- 4 pts/TB for a FortiOS-VM tagged as "FW"
- 10 pts/TB for a FortiOS-VM tagged as "FW + URL"
- 25 pts/TB for a FortiOS-VM tagged as "UTM"

In an example of something using VM Meter service with just a FortiOS-VM Firewall, it would cost them 4 points per terabyte. So if they process 12TB of traffic, it will cost them 48 points (12TB x 4pts).

Overages

Point packs are consumable units that will eventually run out. With that in mind, the system provides a 15 day grace period where points will be allowed to go into a negative balance. Once the grace period has passed, the group will be frozen until more points are added.

If you have a negative balance, say -1000 points; and you purchase a new 5000 point pack. You will have a balance of 4000 points once applied as this will take care of the "past due" balance of points.

Traffic Details

You can view the current traffic information on the FortiOS-VM by going to the firewall interface:

Interfaces:

Y Status	Y Name	Y Members	Y IP/Netmask	Y Type	Y Access	Y Ref.	Y Bytes
Physical (3)							
+	mgmt		192.168.2.116 255.255.255.0	Physical	PING HTTPS SSH HTTP FMG-Access	0	406.17 MB
+	port1		10.10.10.1 255.255.255.0	Physical	PING	1	210.05 MB
+	port2		172.25.188.218 255.255.255.0	Physical	PING	2	2.38 GB

Policies:

Seq.#	Name	From	To	Source	Destination	Schedule	Service	Action	NAT	Security Profiles	Log	Bytes
1	Allow everything	port1	port2	all	all	always	ALL	Accept	Enabled	AV, WEB, APP, IPS, PRE, SSL	UTM	186.51 MB
2	Implicit Deny	any	any	all	all	always	ALL	Deny			Disabled	0B

Or you can check in the CLI:

```
FOSVM1FT-PXM8CB6 # diagnose sys traffic statistics show
getting traffic statistics...
Browsing: 202572 packets, 186418891 bytes
DNS: 918 packets, 191068 bytes
E-Mail: 0 packets, 0 bytes
FTP: 0 packets, 0 bytes
Gaming: 0 packets, 0 bytes
IM: 0 packets, 0 bytes
Newsgroups: 0 packets, 0 bytes
P2P: 0 packets, 0 bytes
Streaming: 0 packets, 0 bytes
TFTP: 0 packets, 0 bytes
VoIP: 0 packets, 0 bytes
Generic TCP: 1061 packets, 197244 bytes
Generic UDP: 56 packets, 7527 bytes
Generic ICMP: 2 packets, 120 bytes
Generic IP: 4 packets, 144 bytes
```

```
FOSVM1FT-PXM8CB6 # diagnose firewall packet distribution
getting packet distribution statistics...
0 bytes - 63 bytes: 8330853 packets
64 bytes - 127 bytes: 1723605 packets
128 bytes - 255 bytes: 1988876 packets
256 bytes - 383 bytes: 230543 packets
384 bytes - 511 bytes: 1209686 packets
512 bytes - 767 bytes: 179547 packets
768 bytes - 1023 bytes: 591668 packets
1024 bytes - 1279 bytes: 11992 packets
1280 bytes - 1500 bytes: 154398 packets
> 1500 bytes: 0 packets
```

Debugging

There are a few debug commands you can use to verify the FortiOS and VM Meter service communication.

FortiManager

Command syntax:

```
diagnose debug application fortimeter 255
```

Example output:

```
diagnose debug application fortimeter 255
FMG-VM64 # Starting resync FortiMeter data from fds ...
FCP_CONN connect to server 172.25.188.203:49291 -> 192.168.100.205:443
CommandObject: Protocol=3.0|Command=SelectivePoll|Firmware=FMG-VM64-FW-5.4-
0990|SerialNumber=FMG-
VM0A15000367|Persistent=false|UpdateMethod=0|DataItem=01000000MTRS00000-00000.00000-
0000000000|ContractItem=FMG-VM0A15000367
Received package header: num_objects=3 total_size=816
Received object header: id=01000000MTRS00000 size=168
Received object header: id=00000000FCPR00000 size=160
Received object header: id=00000000FSSI00000 size=104
Received package ready
SQL:: PRAGMA synchronous = FULL;
MTRS: FMGSN=FMG-
VM0A15000367|TimeStamp=20160108115000|MeterID=FMGVOL0000000142|BalPoints=9999.963556|S
tatus=OK|CostMatrix=VOLUME:FW:4;VOLUME:FWURL:10;VOLUME:UTM:25
SQL:: SELECT fmgns,meterid,contract,status,balance,mtrs_time,report_time,resync_time,cost_
matrix FROM meter_info WHERE fmgns='FMG-VM0A15000367' LIMIT 1;
SQL:: BEGIN IMMEDIATE TRANSACTION;
SQL:: UPDATE meter_info SET fmgns='FMG-
VM0A15000367',meterid='FMGVOL0000000142',contract='FMTR-1-99-
20161202',status='OK',balance=9999,mtrs_time=1452271800,report_time=1452283717,resync_
time=1452284558,cost_matrix='VOLUME:FW:4;VOLUME:FWURL:10;VOLUME:UTM:25' WHERE
fmgns='FMG-VM0A15000367';
SQL:: COMMIT TRANSACTION;
FSSI: SerialNumber=FMG-VM0A15000367|Contract=FMTR-1-99-
20161202|AccountID=jasonharrison@fortinet.com
SQL:: SELECT fmgns,meterid,contract,status,balance,mtrs_time,report_time,resync_time,cost_
matrix FROM meter_info WHERE fmgns='FMG-VM0A15000367' LIMIT 1;
SQL:: BEGIN IMMEDIATE TRANSACTION;
SQL:: UPDATE meter_info SET fmgns='FMG-
VM0A15000367',meterid='FMGVOL0000000142',contract='FMTR-1-99-
20161202',status='OK',balance=9999,mtrs_time=1452271800,report_time=1452283717,resync_
time=1452284558,cost_matrix='VOLUME:FW:4;VOLUME:FWURL:10;VOLUME:UTM:25' WHERE
fmgns='FMG-VM0A15000367';
SQL:: COMMIT TRANSACTION;
>>>>>>>>> __fcp_conn_o_cleanup: obj=140227717215236
FCP_CONN cleanup: server(192.168.100.205:443) SUCCESS!
Resync FortiMeter data from fds 192.168.100.205:443 SUCCESS
>>>>>>>>> __fmtr_o_cleanup: obj=140227717845060
```

FortiOS-VM

Verify communication between FortiOS and FortiMeter

Run from the FortiOS CLI, this command will verify the FortiOS <-> FortiMeter communication.

Command syntax

```
diagnose debug application update -1
```

Example output:

```
FOSVM1FT-PXM8CB6 # diagnose debug application update -1
FOSVM1FT-PXM8CB6 # do_meter[513]-Starting METER
_cache[1277]- port1 (rx: 8283328 bytes 111414 pkts) (tx: 201259810 bytes 138272 pkts)
_current[1286]- port1 (rx: 8283328 bytes 111414 pkts) (tx: 201259810 bytes 138272 pkts)
_cache[1277]- port2 (rx: 273074318 bytes 472935 pkts) (tx: 10884581 bytes 133000 pkts)
_current[1286]- port2 (rx: 273270870 bytes 473870 pkts) (tx: 10896317 bytes 133140 pkts)
_change[1298]- port1 (rx: 0 bytes 0 pkts) (tx: 0 bytes 0 pkts)
_change[1298]- port2 (rx: 196552 bytes 935 pkts) (tx: 11736 bytes 140 pkts)
_make_delta[1313]- (rx: 0 bytes 0 pkts) (tx: 0 bytes 0 pkts)
pack_obj[181]-Packing obj=Protocol=3.0|Command=Statistics|Firmware=FOSVM1-FW-5.04-
1011|SerialNumber=FOSVM1FT-
PXM8CB6|Uid=42044eb6e34c0702cbef3eb3df7fd0a7|Uptime=301|RAM=994|CPU=1|PacketsReceived=
0|PacketsSent=0|BytesReceived=0|BytesSent=0
upd_act_meter[925]-Trying FMG 192.168.2.114-8890
get_fcpr_rsp_code[287]-Unpacked obj: Protocol=3.0|Firmware=FMG300-FW-5.4-
0990|Response=202|SerialNumber=FMG-VM0A15000367|Persistent=false|LicenseType=2
__vdom_cb[1342]-vdom: root enable: 1
do_meter[518]-Success on meter
```

Verify licenced enabled instance on VDOM

You can use this command to check on the root VDOM to see if it's enabled (Licensed instance)

Command syntax

```
diag sys vd list
```

Example output:

```
diag sys vd list
name=root index=0 enabled use=51 rt_num=24 asym_rt=0 sip_helper=1, sip_nat_trace=1, mc_
fwd=1, mc_ttl_nc=0, tpmc_sk_pl=0 ecmp=source-ip-based asym_rt6=0 rt6_num=13 strict_
src_check=0 dns_log=1 ses_num=16 ses6_num=1 pkt_num=904267
tree_flag=1 tree6_flag=1 nataf=0 traffic_log=1 extended_traffic_log=0 svc_depth=2
log_neigh=0, deny_tcp_with_icmp=0 ses_denied_traffic=no tcp_no_syn_check=0
ipv4_rate=0, ipv6_rate=0
mode=standalone ha_state=work prio=0 vid=0
```




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